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Address to the 1939 Meeting of the A.S.P.D.C.

John C. Brauer, *President*

Much activity has been centered in and about the American Society for the Promotion of Dentistry for Children this past year, and the society has grown in many ways. Increases in membership and in State Units have brought the totals to 580 and 17, respectively, all giving our objectives a greater dissemination and distribution. The REVIEW OF DENTISTRY FOR CHILDREN has received the most compliments during the year. The Editorial Board, headed by Dr. Kenneth R. Gibson, with the Editor, Dr. Samuel D. Harris, have made a real and vital contribution to dental literature. No other phase of our activity creates a greater influence within the profession and on our membership than does the REVIEW. The Editorial Board and the Editor should be heartily endorsed and commended for their efforts and accomplishments this past year.

The Certificates-of-Merit awarded to members of the senior classes in dentistry have no doubt been a real stimulus to many students in dentistry and have been proved worthwhile in many respects. Few realize the real mechanism and the amount of work necessary to continued function of the A. S. P. D. C. There is no doubt that the secretary can make or break an organization by his or her attitudes, ambitions, and capacity for work. The Society has been most fortunate in the selection of our present secretary, who keeps the pulse going in various capacities. Every officer, with no exception, has contributed to the success and general welfare of the society this past year.

In the coming years, if this Society is to function and continue as a leader in dentistry for children, we must become even more closely cemented. One great contributing factor has and will be the REVIEW, which gives the member something tangible and of value if he is not fortunate enough to attend the A. D. A. and A. S. P. D. C. meetings each year. In order to maintain membership and perpetuate longevity of interest, the Society must have something definite for that member so that our objectives will continue to live. There has been too great a membership turn-over in the organization to create the desired situation, the chief reason being lack of interest and the feeling that an adequate return has not been received for their membership fee.

The real objective of this Society has been to promote and disseminate knowledge concerning dentistry for children, and this has been done to a remarkable degree. It is a grand, practical theory that has worked, but, for continuance over a long period of time, associated with these objectives must be a desire for membership through some personal gain, meaning knowledge concerning dentistry for children.

The REVIEW has been, essentially, an organ to cement the membership

and since its improvement, the Journal is one of the stimulating lights. Another very valuable asset to the parent organization is the formation of State Units, or component units within the state, giving the local group something tangible and worthwhile. States that have not had a Unit have not progressed as rapidly or as far, and as a result, that state has lost much. For the greatest efficiency and direction of efforts, it may be well to have elected to the Executive Council one delegate from each *dental district,* and the member of this council be delegated and responsible for the development and function of Units within his or her district. The said Executive Council members would then act as trustees and make reports as to the progress or problems within the local districts. Other vital functions could no doubt be assigned to such individuals as it may be deemed essential from time to time.

It has been a distinct privilege to be your president, and there has been no lack of cooperation at any time but always a willingness on the part of everyone to contribute. The A. S. P. D. C. has come a long way, and I, as well as you, know and feel that there is still much that can be done, and will be done through the efforts of the officers and committees so delegated.

The Editor's Report

Samuel D. Harris, *Detroit*

The Editor's Report is pleasant and brief. Our publication's aim, as emphasized by the Executive Council at the St. Louis meeting, is both promotional and scientific. The promotional aspects have been reduced, and the scientific aspects have been actively stressed in the last several issues. As a result, REVIEW has grown in stature as a scientific journal this year.

We are eager that our society soon produce a scientific journal devoted to dentistry for children. Our experience this year, however, cautions that the important promotional possibilities inherent in REVIEW for actively assisting the A. S. P. D. C. should not be dispensed with. The strategic value of REVIEW to the A. S. P. D. C. as a medium for coordinating the viewpoints and the enthusiasm of its members and for correlating the activities of its sectional units should be fully utilized.

What our fast growing society really needs at this time is a considerably larger publication. Our quarterly Journal has filled its twenty-four pages as solidly as is possible. Yet there is enough material left over from our last number to fill almost completely another issue. Special financing through subsidy or through the inclusion of advertising on the same high plane as is done by the *Journal of the American College of Dentistry* might well be considered at this time.

Notes and Votes from the Proceedings of the Milwaukee Meeting

Ralph L. Ireland, *Secretary*

Subscriptions to the REVIEW OF DENTISTRY FOR CHILDREN were renewed by most of the dental schools. Twenty-six schools are now receiving the REVIEW on a subscription basis.

The Certificates of Merit were again sent to the seniors of 32 schools.

Membership in the Society has reached an all time high—the membership roster (as of July 11) lists five hundred and eighty as paid-up members for 1939. One hundred and sixty new members have come into the Society since the St. Louis meeting last October.

Two new state units have been formed, one in Utah and one in Minnesota. This raises the number of state units to seventeen.

The Executive Council heartily endorsed the idea of naming the Boston Section of the Massachusetts State Unit the Frank A. Delabarre Section.

A committee consisting of the President, President-Elect, and the Secretary was appointed to study the feasibility of a joint meeting of the Orthodontic and Children's Dentistry Sections of the A. D. A.

The Secretary was instructed to write a letter to the Section on Dentistry for Children of the Second District Dental Society of New York, commending them for their ambitious program and the work they have done during the past few years.

The Constitution and By-Laws were accepted in their entirety by the A. S. P. D. C. and are to be printed in booklet form.

A committee was appointed to study the advisability of changing the name of the Society, the name of the publication, and to submit a suitable name for the specialty.

The A.S.P.D.C. adopted the resolutions as presented by the A.A.P.H.D. censoring the Milberry proposal and directed that these resolutions be sent to the Board of Trustees of the A. D. A.

The Committee reporting on the 1939 President's address commended Dr. John Brauer, the retiring President, on the scope and completeness of the work performed by him and by his efficient administration.

The proposal to elect a Council member from each A. D. A. district to broaden the scope of the Society's activities was discussed. It was decided that the new set-up, using the delegates from each state unit, be given a trial in lieu of this proposal.

The Annual Report of the State Units and Membership Committee

Konrad Lux, *Waco, Texas*

Each State Unit in the American Society for the Promotion of Dentistry for Children has made definite progress in the past year. There are indications that Montana, Connecticut, Florida, Washington, Maryland, South Dakota, Colorado, Mississippi, and Alabama will be formed into Units before time for the next annual report of the State Units. Particularly interesting are the following reports from some of the State Units:

Louisiana—The New Orleans Dental Association has formed a number of study groups including one on Children's Dentistry and expresses hope that something of a permanent nature in the way of study work will result through this medium. —DR. S. D. GORE.

Vermont—Vermont is awakening to the need for Dentistry for Children. Children's Dentistry has a bigger place on the State Dental Program than ever before and great progress has been made with the Department of Public Health. —DR. BYRON BAILEY.

New York—Two meetings were held during the year of 1938 and 1939. The Unit Secretary, Dr. G. E. Davis, delivered a radio address on "Dental Care for Every Child" under the auspices of the Oral Hygiene Committee of Greater New York and was introduced as "Secretary of the New York State Unit of the American Society for the Promotion of Dentistry for Children."

The annual meeting was held in New York on May 12, 1939, and the following officers were elected: Dr. Theodore C. Blatau, President; Dr. Guy W. Patterson, Vice-President; Dr. Edward J. Doran, Secretary; and Dr. Aaron Apfel, Treasurer. At this meeting, four table clinics were given by members of the New York State Unit. Doctor Blatau, the incoming president, has planned a comprehensive program of activities for the ensuing year.

New Jersey—The New Jersey Society for the Promotion of Dentistry for Children worked in conjunction with the Council of Mouth Hygiene of the New Jersey State Dental Society in an educational campaign on the value of dentistry for children during the fiscal year of 1938 and 1939.

The annual meeting was held at Atlantic City during the State Dental Convention and elected the following officers for the coming year: President, Dr. Stuart DeW. Forrest; Vice-President, Dr. William R. Joule; Secretary, Dr. Paul M. Weber; and Treasurer, Dr. E. DeMonsigle.

Oregon—During the year notable speakers appeared on the programs. Dr. D. T. Meaney presented "Diagnostic Symptoms in Foundation and Mixed Dentition that Predisposes to Malocclusion." Dr. Benjamin Vidgoff spoke on, "Some Phases of Consideration of the Dental Structures as Diagnostic of Endocrine Discrasias," and Dr. E. E. Starr talked on "Slides Demon-

(*Continued on Page* 21)

Who Can Afford to be Healthy?*

John A. Kingsbury, Former Secretary, Milbank Memorial Fund

Who Can Afford to be Healthy? If we approach this question simply and uncritically, and if we subscribe to some notions which are often heard, the answer is obvious. Those who are healthy need only to stay healthy by following good advicie. Those who are sick have only to obtain good medical care, at a cost adjusted to their ability to pay. Thus, the answer to the question is evident. Indeed, it can be given in a single word. *Everyone.* For who is there who cannot afford to listen to good advice? Who is there who cannot afford to give all his worldly possessions, if need be, that he may be healthy? What is the worth of worldly possessions that they may be worth more than health? Not life itself is more precious than health. Only honor and love may be set higher in our scale of values.

Before trying the question: *Who can afford to be healthy?* from another tack, let me ask another question: What does it mean to be healthy? The Romans had a phrase for it: *Mens sana in corpore sano;* to be healthy means a sound mind in a sound body. Generally speaking, a sound body is the prerequisite of a sound mind. As Herbert Spencer pointed out, the first thing "is to be a good animal." A sound body requires adequate nourishment, which means many things. It needs protection from the elements, which means decent housing and suitable clothing. It demands working conditions conductive—or, at least not dangerous—to health. And, too, a sound body needs must have sunshine, fresh air and exercise, rest and recreation. To possess a sound body one must, in short, be in a position to live a hygienic life.

But even all these constitute only the minimum, and they presuppose a good combination of genes. Even if all of these were available to the people of one generation, some will be born with weaknesses, flaws, defects into the next generation; many will contract infections, or suffer accidents or injuries; and many more will be carriers of morbid process which are of uncertain or unknown etiology. The labors of hygiene and of science have not yet absolved the flesh from all the sins it is heir to. Many diseases are not yet preventable. Thus, health requires not only hygiene, but also medicine; diagnosis and cure, as well as prevention. In more concrete terms, the maintenance of health means protection of the water, milk and food supply; protection against contagious and communicable disease; health education; maternity, infancy and child hygiene with all that this implies; general and special clinics; laboratories, hospitals and sanatoria with modern equipment for diagnosis, advice, and treatment, manned by qualified personnel under scientific medical direction. The maintenance of health also requires competent, well-coordinated organization of local, state, and federal public

*Excerpted from an address to the Michigan Conference of Social Work, Detroit, October 1, 1937.

health services, supported by adequate appropriations. It means good medical care for all the people.

In brief, these are the essentials for a healthy life. Equally in brief—and no less emphatically—these are essentials for a healthy nation. I doubt if any informed person will take issue with me on these statements.

What do these essentials of healthy life cost? How much does decent housing cost? We are getting some light on this subject, and we shall soon have more. How much does it cost to nourish the body and to keep it clad according to the demands of a healthful life? We have known the answer for many years.

A hundred studies could be cited as to the minimum cost of living for a family. Disregarding details which do not affect the main conclusion, this much is clear. An American family, living by *minimum* American standards, budgeting its resources as skillfully as only a trained nutritionist or social worker can advise, and not succumbing to the blandishments of high pressure salesmanship—such a model family needs $1,000 to $1,200 a year to maintain a pretense of subsisting in addition to surviving. And only those who have tried living on such a sum or who have worked closely with families living on such a sum know the privations and the sacrifices which this level of *minimum subsistence* means. A long list of studies could also be cited to show that the minimum cost of *decent* and *healthful* living, again by American standards, is something between $1,400 and $2,100 a year. Finally, many studies could be cited to show that if the variable costs of health and medical services are to be capable of being budgeted—along with food, shelter, clothing, and other necessities—by individual families, at least $3,000 a year and possibly $5,000 a year is necessary. In other words, the costs of medical care are so variable that only families with at least $3,000 a year, or possibly with at least $5,000 can individually budget against sickness costs.

Now, we may ask: *How many families have these various incomes?* I'll not plague you with impressive tables of statistics; I'll give you a few simple figures. And in order that they shall be erroneous in a comforting direction, I will choose them from the statistics for 1929, a year in which national income was on the highest level ever attained in the history of the United States. I use as my source "America's Capacity to Consume," by Leven, Moulton, and Warburton of the Brookings Institute.

According to that study, 21.5 percent of families (of two or more persons) in the United States had, in that prosperous year, incomes under $1,000. Another 21 percent had incomes ranging from $1,000 to $1,500. Thus, more than 42 percent of families in this nation, in the hey-day of 1929 prosperity, had incomes under $1,500 a year. Over seventy-eight percent of families in the United States had incomes under $3,000. Ninety-two percent had incomes under $5,000 a year. These were the facts then. Nobody knows what they are now, but it is certain beyond question that the percentages under each of these incomes is greater now than it was in

1929. Thus, we have answers of one sort on the percentages of all families who *cannot* afford to be healthy. And the answers are staggering.

Who then *can* afford to be healthy? Obviously, only the very small minority who are rich and those at least moderately well-to-do can afford to be healthy. Only *they* can afford the healthful homes flooded with sunshine and fresh air. Only *they* can afford the green vegetables and fresh fruits which are essential to radiant health. Only *they* can live free from anxiety about even the birth of a baby, to say nothing of the catastrophic illness which may cost hundreds or even thousands of dollars.

It is almost a pastime in certain medical circles to duck the question by protesting that nobody can say what is adequate medical care. Most of the people who talk on this subject are ignorant of the fact that adequate medical care has been defined and in quantitative, as well as qualitative, terms. I refer to the unique study by Roger I. Lee, M.D., and Lewis W. Jones, Ph.D., entitled, "The Fundamentals of Good Medical Care." These authors set out the qualifications of practitioners, the institutional and other facilities, and the volume and variety of services needed by an average population if it is to receive adequate modern services. Now, one might ask the question: *How much would such adequate services cost?* In a brilliant study, published in 1937, entitled "The Cost of Adequate Medical Care," Dr. Samuel Bradbury of Philadelphia has computed these costs. He did it in a very simple and in a very conservative manner. To the volume and variety of services laid down in the Lee-Jones study of adequacy, he applied the *minimum* charges in the fee schedule of the Chicago Medical Society. Let me summarize for you, most briefly, what he found:

> "On the basis of the Lee-Jones standards of adequacy, modern scientific medicine for the care of diseases and defects among the people of the United States would require annually about seventeen miscellaneous units of service per person. Preventive services for the individual would require annually about 4.5 additional units per person. On the basis of the minimum fees adopted for this study, the services for the care of disease and defects would cost about $63.53 per person; the preventive services would cost about $12.22 per person; both together would cost $75.75 per person a year. This is equivalent to saying that the care of all people in the United States—for prevention, diagnosis, and treatment—would cost about $9,500,000,000 a year. It should be kept in mind that these estimates of service and cost do not include community public health services, dentistry, medicines, or medical and surgical supplies."

How do these estimates for the cost of adequate medical services compare with the *actual* expenditures of the American people? Against Dr. Bradbury's estimate (on a minimum-fee basis), the actual expenditure for the same kinds of services is about $2,000,000,000. In other words, these adequate medical services would cost about four times the current expenditure. Dr. Bradbury's estimate of $75.75 per person for adequate care of limited scope amounts to $260 for a family of average size or 11 percent

of average income at pre-depression levels. This is all exclusive of the cost of community health services, of dentistry, medicines, or medical and surgical supplies.

It would be gratuitous for me to say more than this: adequate medical care purchased by individual families, even on a minimum fee basis, is a luxury far beyond the means of the large majority of American families, not only now, but even in times of greatest so-called prosperity.

There have been estimates before Dr. Bradbury's, on the cost of adequate medical care. One of these, like Dr. Bradbury's estimate, is also based on the Lee-Jones standards of adequate medical care. Unlike Dr. Bradbury's, this estimate by Dr. Louis S. Reed, "The Ability to Pay for Medical Care," includes dentistry, medicines, etc. In spite of its more inclusive scope, this estimate was only $36.00 per person. Subtracting $10.70 per person for dentistry, this estimate becomes $25.30 per person (against Dr. Bradbury's $75.75 per person). Why the discrepancy? Why is Dr. Bradbury's estimate three times as great as Dr. Reed's? What is the difference between the two, both being based on the same standards of adequate medical care? The answer is easily given. Dr. Bradbury's estimate assumes *individual* purchase of medical services on a *fee-for-service* basis; Dr. Reed's estimate is based on the (implied) assumption of *collective provision* of the services with *collective payment* of the costs.

Dr. Reed pointed out that, if charged his estimated (average) cost, the 10 percent of all families with incomes well below the minimum subsistence level could not afford adequate medical care. If the cost of adequate dentistry were brought into the picture, this figure might have to be increased to about 15 per cent. These 10 percent would have to be aided by the more fortunate 90 percent. By contrast, Dr. Bradbury's estimate, based on individual purchase, would place adequate medical care beyond the means of 50 or 75 percent or possibly even a larger proportion of the total population.

Who Can Afford to be Healthy, if adequate medical care is an essential for health? As individual families, perhaps 50 percent, perhaps 75 percent, perhaps an even larger percent of the American people cannot afford to be healthy. As a nation, everyone can afford to be healthy. And the same is true for any large aggregate population which provides and pays for adequate care through methods appropriate to the need. Indeed, as a nation, we cannot afford *not* to have adequate medical care, we cannot afford *not* to be healthy, because the costs of ill health are greater than the cost of health.

Our nation is rich in natural resources. Our people are intelligent, inventive, and industrious. We have proved that we can produce wealth enough to provide every family in America with more than the necessities of mere existence. We have proved that we can produce wealth enough to guarantee to every family a reasonably comfortable and healthy existence. It is merely a matter of applying the same intelligence and ingenuity to

the distribution of wealth and to the distribution of certain necessary costs that we have applied to the production of wealth.

Though the Social Security Act is a long step in the right direction, it is inadequate and defective. In the time that is left to me, I want to deal with one of its principal defects which bears especially upon the Administration's failure to include one of the most obviously important and least expensive provisions affecting the health of its people. I refer to the failure to include compulsory health insurance or some other effective system of socialized medicine in the Social Security Act.

This Act provided for the development of more adequate Federal, State, and local public health services than we had hitherto possessed. But no provision was made to enable self-supporting families of small and moderate incomes to budget as a group against the loss of wages suffered on account of disabling illness among wage-earners and salaried workers and no provision was made to give people protection against the costs of medical care. If, while that important Act was before Congress, the social workers of America had been organized to serve their cause with half the zeal with which the American Medical Association served its vested interest in sickness, wage-earners and others of small means would not have been left unprotected against the serious economic consequences of illness. A small, selfish group so contrived that America's program for social security was brought into being without health insurance. Accordingly, our system of social security lacks completely that unit which long experience abroad has shown is the first essential in a social insurance program. We are still without protection in this country against the cost of sickness despite the fact that, in ordinary times, sickness is the principal cause of poverty and dependency.

One has wondered how long the real leaders of the medical profession, and the rank and file of the various associated professions—dentists, nurses, hospitals, and others—will permit the medical politicians, who too often control medical societies and the editorial columns of the journals, to continue to obstruct progress and to delay and forestall sound legislation. A ray of hope has just begun to shine over the horizon of organized medicine, shining from a massive report recently issued by the American Foundation, entitled "American Medicine; Expert Testimony out of Court." Most strikingly it presents the doctor's dilemma in the testimony of over 2,000 representative leaders in all branches of American medicine from every state in the Union, most of them in practice over 20 years.

The concensus of opinion of the American men of medicine who are credited with the authorship of these volumes is clearly that the doctor "is no longer concerned exclusively with the care of the sick, but also with a guardianship of the health of the nominally well"; that "the present costs of medical care are tragically out of reach of a large part of the population"; that the State has a stake in the health of its people.

Anesthetic Solutions

F. L. Sackett, *Houghton, Michigan*

From the Dental Study Club, Children's Fund of Michigan

Drugs[1] used for the production of local anesthesia are classified into three general groups: Refrigerants, or those which cause anesthesia through the production of cold; certain protoplasmic poisons; and, those having a specific effect on sensory nerves or their endings. As the refrigerant drugs are limited entirely to external surface application, this group must be considered as a topical anesthestic. In the protoplasmic poison group, quinine-urea-hydrochloride is the only drug which has been used to any extent in dentistry and that has been of doubtful value. Its use has been practically discontinued. The third group includes the drugs most commonly used in surgery of the mouth and for obtaining anesthesia of the dental pulp to permit operative work on sensitive teeth as well as pulp removal. This group can be further classified into drugs which are: slightly soluble; or, readily soluble.

Slightly soluble compounds are not suitable for hypodermic injections and are of most value when applied as a surface anesthetic. Readily soluble compounds are sometimes known as "true anesthetics" and are injected hypodermically to combine with the fluid of the tissue cells at the point of application. Cocaine, the oldest of the group of local anesthetics, as well as its derivatives and synthetic substitutes, are all considered as freely soluble.

Kohler, an ophthalmologist, in 1860 was the first to prepare cocaine and describe its effects on the tongue. In 1884, Kohler recommended its use as an anesthetic. In 1905, Einhorn and Uhlfelder produced novocaine, a synthetic substitute for cocaine. This product was manufactured solely in Germany until 1917. During the World War, several manufacturers were licensed to produce the drug in this country, provided a new American name was given it. It was called procaine. Procaine, a synthetically prepared alkaloid, is a white crystalline powder, soluble in water, and can be heated to 300° F. without decomposition. It is as potent in anesthetic qualities as cocaine, but not nearly as toxic. It is not a habit-forming drug and its use is not limited by the Harrison Narcotic Law. Mead[2] states that of all the drugs offered to the dental profession for anesthesia, procaine appears to be nearest to the ideal. It is used in either a one or two percent solution with a vaso-constrictor added in concentrations from 1:100,000 to 1:20,000.

Requirements of an anesthetic solution: Cocaine produces a profound and lasting anesthesia but it possesses several objectional qualities. Listed by Blayney[3]: (a) Its general poisonous action (b) Sometimes produces

sloughing—effect of protoplasmic poison on tissues (c) Frequently of undesirable idiosyncrasy (d) Decomposition when boiled to sterilize solutions (e) Poor keeping qualities of solutions (f) Tendency to form vicious habits.

Blayney further lists six requirements of an "ideal anesthetic" as: (a) Less toxic than cocaine (b) Indifferent to tissues when injected and not to retard the healing of wounds (c) Readily soluble in water, stable when in solution, and sufficiently resistant to heat to permit sterilization by boiling. (d) It must easily penetrate mucous surfaces (e) Must permit use of epinephrin (f) It must not be habit forming.

Hogeboom[4] in his book on Juvenile and Public Health Dentistry lists desirable qualities of a solution for children as: (a) Minimum toxicity, compatible with tissue and blood (b) Isotonicity (c) Must be mixable with adrenalin (d) Alkaline if possible, not over 7.8 pH (e) Must allow accurate dosage (f) Easily sterilized without injury to the solution. Procaine hydrochloride is Hogeboom's choice for use in children.

Vaso-constrictors: Local anesthetics lose their local actions when they become absorbed into the general circulation[2]. They become more toxic as they become absorbed because of their action upon the higher nervous centers. To produce a good anesthesia and yet control the toxic effect, the solution must be confined to the local area using as small an amount of solution as possible. This is accomplished by use of a vaso-constrictor. Epinephrine is the vaso-constrictor of choice of most authorities. Others sometimes used are: cobefrin, synephrin, and neosynephrin. All of these are more or less closely related chemically to epinephrine; their physiological action is also similar.

There is much discussion and comparison of the vaso-constrictors in recent literature. Miller and Stuart[5] suggest a two percent solution of procaine, containing 1:20,000 and 1:50,000 epinephrine; or a two percent procaine solution with 1:10,000 cobefrin. Sweet recommends a two percent procaine solution with a 1:50,000 epinephrine vaso-constrictor for use in children, using only 2 c.c. at one time. Tainter, Throudson, and Moose[6] find that a solution containing 1:50,000 epinephrine could be matched in effectiveness by a solution of 1:20,000 cobefrin or between 1:488 and 1:4,587 neosynephrine. They found that for equal volumes of solution injected, cobefrin and neosynephrin caused much greater changes in blood pressure and pulse rate than epinephrine[7]. The speed of onset of anesthesia was greatest for procaine containing the weaker epinephrin and progressively slower for the stronger epinephrine, cobefrin, and neosynephrin in this order. The duration of anesthesia was longest for the strong epinephrin procaine solution and shortest for the weak solution, with cobefrin and neosynephrin occupying intermediate positions. The most bleeding occurred after the use of neosynephrin, slightly less after cobefrin, still less after the weaker epinephrin solutions, and least after the stronger epine-

phrin solutions. Reactions during anesthesia as judged by frequency of perspiration, nervousness, tremor, or fainting were least with procaine containing neosynephrin, slightly greater with epinephrin 1:50,000, still greater with cobefrin, and most marked with epinephrin 1:25,000.

All factors considered, other solutions show no superiority over procaine with 1:50,000 epinephrin. Miller and Stuart[5] agree that the more dilute the epinephrin solution used, the less pronounced the resulting changes in blood pressure, pulse rate, and tendency toward disturbing chemical factors. The Committee on Pharmacy and Chemistry of the American Medical Association[8] state that procaine solutions greater than 2 percent should not be used and that epinephrin should never be used in strengths greater than 1:10,000. Hogeboom recommends a solution isotonic and of low supraenin content for children. If a stronger supraenin content is used the injection must be made very slowly.

Alkaline and Buffered Solutions: According to Grossman[9], the pH of an anesthetic solution affects the anesthetic in three ways: (a) Efficiency of the anesthetic solution (b) The induction time of the anesthesia (c) The healing and repair of the tissue in the injected area.

Freeman[10] and others have shown the advantage of buffered solutions of a pH of 7.4 to 8.2 in the way of a prompt anesthesia and very little systemic reaction. The solution used by Freeman is procaine hydrochloride, to which sufficient sodium carbonate has been added to raise the pH to 8.0. He claims mandibular anesthesia can be attained in one or two minutes and that local and systemic reactions are materially reduced.

The theory advanced by Grossman[9] is that when procaine hydrochloride is injected, anesthesia does not begin until the anesthetic salt is changed by the tissue fluids to an anesthetic base. The solutions must be changed from a pH of around 5 to pH of over 7 before anesthesia occurs. The injection of an alkaline solution such as procaine borate or a freshly prepared alkaline solution of procaine hydrochloride does not need any reaction on the part of the tissues to liberate the anesthetic base, consequently the anesthetic effect is almost immediate and does away with the period of "waiting for the anesthetic to take effect."

Tainter, Throudson, and Moose[11] do not agree on the superiority of an alkaline solution. They believe that the factors of isotonicity and pH have been emphasized beyond their real importance in local anesthesia. Upon comparing a 2 percent solution of procaine hydrochloride and a 4 percent solution of procaine borate, they report:

> No difference in amounts of solution required or of time for anesthesia to develop or its duration. Complete anesthesia developed in only 5% more of the patients while using procaine borate than when using procaine hydrochloride. There was slightly less bleeding after the use of procaine borate than after the use of procaine hydrochloride.
>
> The effects of blood pressure, pulse rate, and respiratory rate from the two solu-

tions were practically identical; both caused small average changes in pulse rate, respiration, and systolic blood pressure and a slight fall in diastolic blood pressure. There was a definitely greater increase of the systemic "reactions" with procaine borate; that is, perspiration, nervousness, tremors, and fainting occurred almost twice as often as with pprocaine hydrochloride. Although there were no differences in pain or inflammatory reaction at the site of injection, from use of the two solutions, the undesirable effects in the operative field were definitely less with procaine borate. In view of the fact that solutions of procaine borate must be made fresh and can be sterilized only with special precaution, and show only minor degrees of superiority but definitely less desirable results as to immediate systemic recations, as compared with those of procaine hydrochloride, procaine borate at the best is no more desirable as a local anesthetic than the commonly used procaine hydrochloride.

The Northwestern University Dental School's report[10] on ethocaine borate used in clinical practice, in comparison with procaine hydrochloride, using a 2 percent solution of each and injecting equal amounts of solution, is as follows:

There is evidence to believe that toxic symptoms are possibly less and certainly not more than procaine in the same quantity. The resulting anesthesia is obtained much more rapidly, is equally profound, and of slightly shorter duration than with procaine in the same quantity and with the same technique. The local post-operative pain is not caused by the drug ethocaine borate. For satisfactory results in local anesthesia, it is necessary to incorporate a vaso-constrictor with ethocaine borate.

The Council of Dental Therapeutics[12] in their publication "Accepted Dental Remedies" assert that procaine borate injected subcutaneously exerts a prompt and powerful anesthetic action and that it is non-irritating. Due to the smaller content of base of procaine borate, the total dose may exceed that of procaine hydrochloride by about 50 percent.

The Vehicle for a Local Anesthetic Solution: An isotonic solution is thought of as a solution that has the same density as the wall content and when injected into tissues, exerts no osmotic pressure. To be isotonic, a solution must have the same freezing point as the body fluids, which is around —0.56° C. A hypotonic solution is one which has salt constituents less than the cell content. When it contacts, the permeable cell wall osmotic pressure causes the cell to expand. A hypertonic solution is one containing a high salt concentration which causes tissue cell collapse due to osmosis. Solutions too hot or too cold are irritating. The most ideal is a solution of the same temperature as the tissues.

Distilled water is a safe vehicle, especially when used as a buffered solution. Ringer's solution contains sodium chloride, calcium chloride, and potassium chloride. Different strengths are used to regulate the tonicity of the solution. Normal sodium chloride solution is an isotonic solution of sodium chloride and distilled water. Buffered solutions are solutions in which the pH (hydrogen ion concentration) is raised to that of the body fluids (7.4). Mead[2] recommends an isotonic solution with a pH of 7.4 at body temperature as the ideal vehicle. Hogeboom[3] would use an isotonic

alkaline solution not over 7.8 pH for children.

Preparation of Anesthetic Solutions: Nearly all authoritiees agree that anesthetic solutions should be prepared fresh at or near the time of their use by bringing together tablets or weighed amounts of powder in a proper medium[13]. The Council of Dental Therapeutics found that stock solutions in sealed and rubber stoppered ampules were unstable; that the epinephrin tended to decompose with the alkalinity was raised; that the solutions of a high pH should be freshly prepared; that attempts to add stabilizers to prevent oxidization of the epinephrin have failed. Rubber stoppered cartridges are accepted under the same conditions as glass ampules. The acidity and possibly the presence of heavy metals resulting from the interaction of the liquid on the rubber of such solutions are other unfavorable factors. There is also a possible lack of sterility.

Hospitals and general surgeons without exception favor freshly prepared solutions for local anesthesia[2]. Tablets containing local anesthesia marketed by reputable manufacturers may be regarded as satisfactory, but the exact composition must be known at all times. When brought into solution carefully, these tablets should give unvarying results.

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Matrices for Deciduous and Young Permanent Teeth

E. Kassab, *Chester, Penna.*

Every dentist who uses a matrix will probably agree that its use permits the proper condensation of an amalgam filling in a proximal cavity, the protection of the gingival tissue from a bulk of overhanging filling material, and the proper restoration of the proximal contour and contact point. To fulfill these requirements all matrices should have certain properties; they should be immovable, be adaptable at the gingival, have sufficiently rigid walls, maintain a contact point, and be easily removed.

There are a number of matrices on the market that fulfill these requirements. Each operator is justified in the use of the one with which he feels most proficient and which gives him the best results. However, one matrix is not adaptable to universal use. It is to the operator's advantage, therefore, to have a knowledge of a few simplified matrix technics which he can apply whenever his usual matrix technic fails.

A number of types of matrices that are used by different schools and by various dentists may be selected. Perhaps the simplest type of matrix that can be found consists of a straight steel strip which is adjusted to the correct height and is wrapped completely around the tooth one and a half times. The band is held in place by passing it between the contact points opposite from the proximal cavity that is being filled. Such a matrix is advocated only for deciduous teeth. Its usefulness is due to its simplicity and the ease with which it is adjusted. There is nothing about it to interfere with the cotton rolls and there is nothing to be displaced by the tongue or the muscles of the cheek.

For many operative procedures on permanent teeth a modification of Black's matrix may be used. With this matrix, if previous slow separation has not been procured, a separator can easily be applied which does not interfere with the matrix but helps adapt it at the gingiva. The matrix can be quickly made from a piece of copper by cutting a strip of the proper height to extend three-fourths of the way around the crown of the tooth. The strip may be cut with lugs at either end or a rubber dam punch may be used to punch holes which will hold a ligature. After such a band is annealed, it can easily be tied around the tooth. This matrix may be left in place for a large restoration until the filling has completely set.

A complete copper band is also serviceable for use with large restorations and may be left in place until the patient returns. In the same length of time that it would take to adjust and adapt a ready made band, the correct measurement may be taken with a dentimeter, a copper strip cut to the correct size, and soldered as described.

Another very easily made and satisfactory matrix has been discussed by John C. Brauer of the University of Iowa. It consists of a steel strip that has

been adjusted to the proper height, wrapped completely around the tooth and held in place by means of a tinner's joint. Such a matrix is frequently superior for deciduous teeth since it is better adapted to their contour.

A unique matrix for taking inlay patterns is one that is made from celluloid. A measurement is taken with a dentimeter, the piece of celluloid which remains when the emulsion has been boiled from a discarded X-ray film is cut to size, the edges are sealed with a little acetone, and the matrix is slipped to place. This celluloid matrix allows one to see all the surfaces of the cavity and readily determine whether all cavity margins have been covered by wax. A wedge at the gingival will assure complete adaptation.

A number of mechanical matrix retainers are in current use. There are the three types of Ivory retainers which may be used, numbers 5, 8, and 9. Numbers 8 or 9, used with a band which completely surrounds the tooth, are preferable for deciduous teeth. The Onderdonk and the somewhat similar Wagner retainers can be used for either the permanent or deciduous teeth. With all these matrix retainers wedging is the only measure which will assure adaptation and give a slight amount of separation. Separation from a wedge at the gingiva is insufficient to provide for certain requisites. In the first place it fails to compensate for the loss of space when teeth with large proximal cavities drift together; secondly, it does not provide a slight excess of filling material which is needed to make up for the width of the matrix; and thirdly it does not allow for easy finishing of the proximal surface. A mechanical matrix retainer fails to gain separation where separation is needed. Without previous slow separation a separator must be used, a mechanical separator and a matrix retainer are not easy to use on the same tooth at the same time.

A combination separator and matrix retainer may be made by soldering two small prongs to either arm of a Perry Separator. A small piece of steel matrix can then be placed interproximally and held tightly at the gingiva by the separator. Two pieces of compound which have been heated in a flame and placed interproximally, both bucally and lingually on the prongs of the arms of the separator, will adapt and hold the matrix firmly against the walls of the tooth. Such a combination is easily and quickly applied and is especially useful for large cavities. The matrix in this case not only allows for proper separation of the teeth, but fills all the other requirements of a good matrix.

The S. S. White Company puts out a punch, No. 141-A. Once the size of a band has been measured by the use of a pair of flat beak pliers, a joint can be made with this punch, and the band can be slipped back on the tooth. This is another satisfactory matrix for deciduous teeth.

No proximal cavity in a child's tooth can be successfully filled by a plastic material without the use of a matrix. Since the matrix plays such an important part in the insertion of good fillings and since, as dentists, good fillings are our business, we should take just a little more time in our choice and adaptation of matrices.

The Dentist's Moral Obligations*

R. M. Erwin, *Portland, Oregon*

In dealing with this problem of moral obligation—really a phase of professional ethics—a practitioner, who may encounter an obstreperous child of any age or one he feels is too young, who possibly doesn't feel he is temperamentally qualified, or who just isn't interested in such cases, has one of three alternatives, with their sequelae:

(A) He may belittle the urgency and value of such needs and indict himself immediately for negligent malpractice or at least for not having kept up with the advancements of his profession, only to have the adult parent patient learn later of his falsifications; and thereby lose their esteem and confidence. In this respect, I wish to express in passing a problem that oftentimes is most embarrassing and trying. Parents will bring their children to me, seeking information and services, and they ask questions, not always about the dentition of the child and what should or should not be done, but why Doctor — had not informed them of these factors or why he had not done the work properly so that the fillings would not fall out; why the teeth had died after being filled, and why he had told them "They are only baby teeth." Fortunately, many times the conditions that exist permit diplomatic explanations. Possibly the conduct of the child had not permitted the rendition of services such as the dentist would have been capable of had the child been better behaved. On the other hand, possibly the visit to his office had been delayed so long that complications had set in and death of the tooth had resulted in spite of his efforts rather than because of them. But, there are instances where the parent has taken the child regularly since he was 2, 3, and 4 years of age; they recall having been advised that "We'll wait a little until the cavity gets a little bigger." "We'll wait until it causes trouble." "They're only baby teeth." What loophole is there then available for saving my brother practitioner's patient's esteem? I've already told the parents the truths about children's dentistry, as recognized by the directing agencies of our profession and the A. D. A. Is there not a principle of ethics involved? Obviously there is; the preamble to our code of ethics states that one of the purposes is professional protection of the layman against indifferent practitions and practices. Who under such circumstances is entitled to the protection of our "Code"? You formulate your own right thinking answer.

(B) The operator may frankly admit his inability to cope with the situation or his lack of understanding of the special care demanded by the foundation dentition as different from the adult matured teeth and permit the parent patient to leave, seeking blindly more specific information from one who might not be so honest.

(C) Candidly acknowledging that in many instances such cases require the attention of one who is not necessarily a specialist but more temperamentally qualified and who has learned something of child psychology and management as well as the specialized pedodontic procedures; and if he knows of such a man in his community to send the parent and child to him for services which will be mutually satisfactory and serviceable. The result? A parent patient who will appreciate their dentist's honesty and the consideration of placing them in the hands of one who will render services of which none of the parties need feel apologetic later.

Coincident with our desire to obliterate from our profession "It's only

*Condensed from a paper read before the North Pacific Dental College Alumni Association Convention, February 23-25, 1939.

a baby tooth" we also wish to include another abolishment. I refer to a common trend of thought, either conscious or subconscious, on the part of many practitioners toward thinking of general dentistry for children with the attitude of temporary intervention. With this latent thought existing in the operator's mind, he is not adequately prepared to cope with resistant arguments of a parent whose conscious attitude is the futility and needlessness of any expense at all for dental services for the foundation teeth. The result is that the operator, guided by his own attitude, influenced by that of the parent, either dismisses the issue with indifference or hesitantly quotes a meager fee that permits only hurried and inadequate efforts that predispose to failure and subsequent disappointment and disgust on the part of both the practitioner and the parents and their friends.

Let us approach this problem from an economic point of view. I state a fact with which we are all familiar—namely, that the expenditure of time is one of the basic principles in the establishment of fees for dental services, irrespective of what the services are to be or to whom they are rendered. It is not generally understood by the parents nor realized by many practitioners that the foundation teeth and immature permanent teeth are constructed in different detail than are the adult permanent teeth. Furthermore, due to these differences, the preparations, selection of restorative materials, their insertion, and general care of these foundation teeth and immature permanent teeth necessitates additional precautions if they are to be preserved satisfactorily and their vitality protected. The result is that satisfactory treatment and the desirable quality of service to these children's teeth actually takes longer than would the same type of cavity in the adult's mouth. Then there is the additional time that should be taken, and that is beneficially expended, to train and guide the young mind in favorable responses to experiences and procedures in our offices.

These characteristic details of pedodontic procedure demand in their own right that the work be done with the same precision and caution with which the work is done for the adult teeth, and consequently the fees must of necessity be at least proportionately the same. If we as progressive members of our profession are willing to view these dental needs of children and the principles involved with an open mind, be willing to be convinced that dental services of a desirable quality for children are of as much vital importance to them as similar services are for adults, are willing to recognize the fact that success and failure in dentistry for children lie essentially in our own operative abilities and judgments, fortified and based on the convictions that children's dentistry is a real service of health and prevention, then we will be qualified and prepared to reason with and convince many skeptical parents that adequate fees and good dentistry go hand in hand with services for children.

To substantiate these principles, I offer the following quotation made

by Dr. John C. Bauer, head of the Department of Preventive Dentistry and Children's Dentistry, University of Iowa Dental College, and President of the American Society for the Promotion of Dentistry for Children:

> "May I remind you that you as practitioners will have to employ the wiles of salesmanship because the man who can present his story the best and most convincingly will be the one who will be doing most of the work and for better fees. If the practitioner can describe in a convincing way or visualize for a parent the true significance and value of children's first teeth to health and future happiness, the problem of financial return will be materially lessened. It is true that many parents anticipate a remark of "No charge" from the dentist and the result is that much of the dentistry in the mouths of children today is of *no charge quality*. Some operators spend too much time trying to amuse their child patients. It is true the fond mother or father will stand by and enjoy watching one spend much time playing with their child, but they certainly will not react pleasantly when they receive a financial reminder."

The alarm with which the A.D.A. is concerned about "The Dental Health of the American Youth" and the interest of the directing agencies of our profession in doing something about its improvement are portrayed by the fact that only one night presentation of scientific material was accorded a place on the crowded schedule of the 1938 meeting. That program which occupied so honored a distinction was not devoted to denture service, crown and bridge service, oral surgery, or any other "close the barn door after the horse is gone" service, but was devoted to preventive dentistry and children's dentistry. This statement is not made with any maliciousness of purpose or any attempt to belittle the proved value of such services, but solely for the purpose of stressing the fact that such services do not offer the maximum of preventive serviice at the logical period of life of the individual. This aforementioned symposium, at the request of Dr. Camalier, the 1938 A.D.A. President, was presented under the direction of the American Society for the Promotion of Dentistry for Children.

Are we—claiming to be a part of ethical dentistry—going to be able to say we are contributing to this progressive and worthwhile objective of the dental profession—"Dental Health for the American Youth"?

State Units' Report

(*Continued from Page* 5)

strating Dentinal and Pulp Changes as Influenced by Incipient Caries." An interesting address on "Protective Cast Cores for Porcelain Restoration" was given by Dr. Christian Kisky. Dr. R. M. Erwin, Jr., gave a group clinic presentation on "Sharpshooting Common Mistakes that Lead to Damaging

and Embarrassing Failure of Class I and II Amalgams for Foundation Teeth" (with pre-school patients on exhibit). —DR. R. M. ERWIN.

Utah—In March, the unit had the privilege of having Dr. Wallace Calder, of Vernal, Utah, as guest speaker and clinician. Doctor Gerrie, who is in charge of the Utah Mobile Dental Health Unit, was also a guest and speaker. —DR. CLIFFORD RUDINE.

California—The California Unit reports a paid-up membership for the first half of 1939 to be 42 against 35 for 1938. Meetings have been outstanding during the year, due to having had such notable speakers as Dr. Floyde E. Hogeboom, Dr. Camp, Dr. Charles Woodward, Dr. Spencer R. Atkinson, and Dr. Thadius P. Hyatt. There has been active work in the State Legislation in California for the cause of Dentistry for Children. Two bills have been passed by the Assembly and the Senate and now wait the governor's signature. —DR. HUGO M. KULSTAD.

Michigan—Membership has increased substantially and now totals 74, with 46 active and 28 associate members. The society's activities centered around a number of interesting and varied meetings for the year. One program was entitled "Professors Quizzed." The professors were obtained from the Executive Board of the University of Michigan Dental School, consisting of Dean Bunting and Doctors Rickert, Vedder, Kemper, and Easlick. These men participated in the meeting in much the same mannet as the experts on the "Information Please" program. The program was very popular and informative and created desirable comment for the society. At the annual meeting, the largest audience in the history of the organization listened to "Dentistry for Children, Its Progress Nationally and in This State," given by Dr. John C. Brauer.

—DR. BARNETT MALBIN.

Missouri—Headed by Dr. Thomas Thompson, president, and Dr. Robert Harris, Jr., secretary-treasurer, the unit is actively engaged in cooperating with the state and county dental health programs. The unit has a membership of 22 and during the year has had seven formal meetings. At the last meeting, the talk by Dr. John C. Brauer certainly helped increase the interest in Dentistry for Children. —DR. RUTH MARTIN.

Minnesota—The Minnesota Unit of the A. S. P. D. C. was organized on February 22, 1939. The following officers were elected: President, Dr. H. C. Wittich; Secretary-Treasurer, Dr. George Moulton. This group met solely for the purpose of setting up the organization but already has made plans to begin active study group work in the fall. The membership at the present time is approximately 30. —DR. H. C. WITTICH.

Texas—At the State Meeting, the Texas Society for the Promotion of Dentistry for Children joined with the Texas Society of Orthodontists to present a symposium on Children's Dentistry. A luncheon meeting was held in which the election of officers took place. At present, some of the

members have been actively engaged in assisting the Health Department in giving Refresher Courses in Dentistry for Children.

—DRS. EUGENE T. STEGALL and HAROLD YOUNGER.

Nebraska—Due to the short year, the N. S. P. D. C. activities have been rather limited. The annual meeting was held during the State Meeting and about 60 were in attendance and 26 joined up in the State Unit. The Society held a symposium on Children's Dentistry. Dr. Ralph Ireland presented "Pulp Management for the Deciduous Teeth" and Dr. Howard Yost talked on "Preventive Orthodontics." —DR. WALLACE WEBSTER.

Pennsylvania—The P. S. P. D. C. met four times last year. Each meeting was preceded by a dinner which afforded the members a social hour for discussion of ideas and problems concerning dentistry for children. Dr. C. W. Hagan writes from Pittsburg that a society is being organized and will join in with the Pennsylvania Unit. —DR. ELIZABETH BEATTY.

Maine—As out-going president of the unit, Dr. Normand Jean Paquette gave a splendid address at the State Meeting. The present membership is 12, and there are prospects of several more joining the unit after the Milwaukee meeting.

Report of the College Curriculum Survey Committee*

For years essayists and clinicians on Children's Dentistry have been greeted by the manifest skepticism of many general practitioners. The general practitioner is prone to doubt the clinician's ability to apply profitably in private practice the procedures which he advocates in a dental meeting. A similar skepticism is frequently shown in regard to the clinician's ability actually to manage the behavior of small children in a dental chair. Often the remark has been made, "That is not what we were taught when we were in school." A group statement from the teachers themselves should remove at least this one erroneous viewpoint in regard to what is now being taught. It should also serve to discredit certain methods of practice for children such as the construction of "amalgan bridges" and the failure to remove infected teeth that are "left to hold space."

The report of the Curriculum Survey Committee of the American Association of Dental Schools in 1935[1] provided no space in the dental curriculum for a course in Children's Dentistry. This report, by recommenda-

*The report of this committee is reproduced in part in this issue of the REVIEW. The results of a survey (questionnaire) of the dental schools in this country will be published in the next issue.

1. Report of the Curriculum Survey Committee, American Association of Dental Schools: A Course of Study in Dentistry. Chicago, 1935. Pp. XIII + 412.

tion, placed all instruction in dentistry for the child patient in a course entitled "Application of Prevention Principles," a course which was designed to teach "remedial preventive measures" from prenatal life to old age. Since this 1935 report appeared to disregard the fact at the time of its publication some type of course in Children's Dentistry was being taught in thirty-eight schools,[2] a questionnaire seemed to be an excellent means to register the approval or disapproval of teachers as to the manner in which this subject should be taught.

Two recent developments have appeared to make the question of the place of Children's Dentistry in the dental curriculum unusually important. The increasingly rapid mechanization of industry has brought with it what has been termed the "modern plague," insecurity. The laboring man has asked himself three questions: (1) "Am I going to have a job?", (2) "If I have a job, am I going to be physically able to perform its functions?", and (3) "If I keep my job, am I going to able to lay aside enough to take care of me in my old age?" Social Security legislation has provided unemployment insurance as an answer to the laborer's first question, and old-age retirement insurance as the answer to his third question. The answer has not come to his second question, but the introduction of the Wagner Health Bill (Senate Bill, S. 1620) indicates that this answer too is on its way, and may be consummated this next year. In the light of proposed legislation, the American Dental Association has begun to think in terms of a program of preventive service for children and continuing education for the dentist after graduation.[3] This program will emphasize the practice of Children's Dentistry and at the same time will foster the development of graduate and postgraduate courses and the certification of the specialist. The College Committee has raised this question, "In view of the increasing importance of Children's Dentistry in the social program, is it wise to submerge this subject in a newly created course?"

Some members of the American Society for the Promotion of Dentistry for Children have raised the question several times, "What term should be used for the science of Children's Dentistry?" The present questionnaire has obtained an expression from the teachers.

To guide any action which may be taken on terminology, a statement has been obtained from Dr. Marcus L. Ward and included in this report. In the use of the suffixes *-ia, -ics,* and *-ology,* he says:

-ia is a noun suffix used for

(1) Names of diseases, as in neuralgia, hydrophobia

(2) Names of alkaloids, as in atropia, morphia, strychnia

2. Report of the College Committee of the American Society for the Promotion of Dentistry for Children: A Survey of Children's Dentistry in the Curriculum. J. A. D. A., 23: 903-908, May 1936.

3. Statement of the National Health Program Committee at the Hearing on the National Health Act of 1939, Held June 1, at Washington, D. C., J. A. D. A., 26: 1219-1225, July 1939.

-ology is a combining form used to denote

(1) a speaking or saying, as in eulogy, tautology

(2) a doctrine, theory, or science, as in

zoology	theology	pathology	neurology
sociology	psychology	histology	geology
physiology	radiology	biology	bacteriology

(3) Names of plants, as in Dahlia, Fuchsia, Wistaria

(4) Names of classes of plants and animals, as in Mammalia, Reptilia

(5) Names of various other words, as in Militia, Magnesia, Bacteria.

-ics is a suffix used in certain sciences and systems of doing things, as physics, mathematics, hydrostatics, accoustics, dynamics, athletics, politics, clinics, technics.

The fact that certain systems, such as music, rhetoric, logic, magic, and arithmetic, have their designations end in *-ic,* and others, such as politics, athletics, and technics, have their designations end in *ics,* seems to have confused some of those who have opposed the adoption of the term Orthodontics to designate the science formerly known as Orthodontia. *-ics* as a suffix to designate certain sciences along with *-ology* has apparently escaped the attention of those who have held to the view that it was an incorrect and undignified term to designate a branch of dentistry.

Another thing which has apparently contributed to the confusion that exists is the lack of etymologic significance of the suffix *-ic* which has become a specific one for the conversion of many nouns to adjectives, e.g., histology to histologic, anatomy to anatomic, metal to metallic, electricity to electric, etc.

From these well established usages, it would seem desirable to adhere to the use of the suffixes *-ics* and *-ology* to designate the sciences. Moreover, the tendency of other sciences to follow this policy makes it imperative in the interests of accuracy to adopt this policy exclusively for dental nomenclature.

In regard to the stem of the name that may be adopted, it should be stated on the same authority as above that *pedio-* is from a Greek term which refers to feet, literally, "a plane or flat surface" or a surface "good to walk on." *Pedo-,* on the other hand, comes from paidos, meaning child. A comparison of the derivations of *pedo-* and *pedio-* makes the selection of a preferable term rather obvious.